Directive 2012/27/EU of the European Parliament and of the Council of 25 October
2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU
and repealing Directives 2004/8/EC and 2006/32/EC (Text with EEA relevance)

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ANNEX II

## METHODOLOGY FOR DETERMINING THE EFFICIENCY OF THE COGENERATION PROCESS

Values used for calculation of efficiency of cogeneration and primary energy savings shall be determined on the basis of the expected or actual operation of the unit under normal conditions of use.

(a)      High-efficiency cogeneration

For the purpose of this Directive high-efficiency cogeneration shall fulfil the following criteria:

—      cogeneration production from cogeneration units shall provide primary energy savings calculated according to point (b) of at least 10 % compared with the references for separate production of heat and electricity,

—      production from small-scale and micro-cogeneration units providing primary energy savings may qualify as high-efficiency cogeneration.

(b)      Calculation of primary energy savings

The amount of primary energy savings provided by cogeneration production defined in accordance with Annex I shall be calculated on the basis of the following formula:

$$PES = \left( 1 - \frac{1}{\frac{CHP\ H\eta}{Ref\ H\eta} + \frac{CHP\ E\eta}{Ref\ E\eta}} \right) \times 100\ \%$$

Where:

PES is primary energy savings.

CHP Hη is the heat efficiency of the cogeneration production defined as annual useful heat output divided by the fuel input used to produce the sum of useful heat output and electricity from cogeneration.

Ref Hη is the efficiency reference value for separate heat production.

CHP Eη is the electrical efficiency of the cogeneration production defined as annual electricity from cogeneration divided by the fuel input used to produce the sum of useful heat output and electricity from cogeneration. Where a cogeneration unit generates mechanical energy, the annual electricity from cogeneration may be increased by an additional element representing the amount of electricity which is equivalent to that of mechanical energy. This additional element does not create a right to issue guarantees of origin in accordance with Article 14(10).

Ref Eη is the efficiency reference value for separate electricity production.

(c)      Calculations of energy savings using alternative calculation

Member States may calculate primary energy savings from a production of heat and electricity and mechanical energy as indicated below without applying Annex I to exclude the non-cogenerated heat and electricity parts of the same process. Such a production can be regarded as high-efficiency cogeneration provided it fulfils the efficiency criteria in point (a) of this Annex and, for cogeneration units with an electrical capacity larger than 25 MW, the overall efficiency is above 70 %. However, specification of the quantity of electricity from cogeneration produced in such a production, for issuing a guarantee of origin and for statistical purposes, shall be determined in accordance with Annex I.

If primary energy savings for a process are calculated using alternative calculation as indicated above the primary energy savings shall be calculated using the formula in point (b) of this Annex replacing: 'CHP Hη' with 'Hη' and 'CHP Eη' with 'Eη', where:

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Hη shall mean the heat efficiency of the process, defined as the annual heat output divided by the fuel input used to produce the sum of heat output and electricity output.

Eη shall mean the electricity efficiency of the process, defined as the annual electricity output divided by the fuel input used to produce the sum of heat output and electricity output. Where a cogeneration unit generates mechanical energy, the annual electricity from cogeneration may be increased by an additional element representing the amount of electricity which is equivalent to that of mechanical energy. This additional element will not create a right to issue guarantees of origin in accordance with Article 14(10).

(d)     Member States may use other reporting periods than one year for the purpose of the calculations according to points (b) and (c) of this Annex.

(e)     For micro-cogeneration units the calculation of primary energy savings may be based on certified data.

(f)     Efficiency reference values for separate production of heat and electricity

The harmonised efficiency reference values shall consist of a matrix of values differentiated by relevant factors, including year of construction and types of fuel, and must be based on a well-documented analysis taking, inter alia, into account data from operational use under realistic conditions, fuel mix and climate conditions as well as applied cogeneration technologies.

The efficiency reference values for separate production of heat and electricity in accordance with the formula set out in point (b) shall establish the operating efficiency of the separate heat and electricity production that cogeneration is intended to substitute.

The efficiency reference values shall be calculated according to the following principles:

1.     For cogeneration units the comparison with separate electricity production shall be based on the principle that the same fuel categories are compared.

2.     Each cogeneration unit shall be compared with the best available and economically justifiable technology for separate production of heat and electricity on the market in the year of construction of the cogeneration unit.

3.     The efficiency reference values for cogeneration units older than 10 years of age shall be fixed on the reference values of units of 10 years of age.

4.     The efficiency reference values for separate electricity production and heat production shall reflect the climatic differences between Member States.